pieces of meat, or other substance, to attract the flies, upon which the frogs feed; they will also eat the maggots of decayed meat, and even the meat itself. It appears that the demand for frogs in America is increasing, and in that case a frog-farm might be made a good investment.

OF the 120,000 salmon eggs which were sent from England to New Zealand in the winter of 1872, only about 60 are now alive. Although the ship *Oberon* by which they were sent was only 93 days on the passage, she was delayed on her arrival at Dunedin in consequence of a quantity of gunpowder being on board, which was obliged to be discharged before she could get into port. Probably the eggs were not properly fertilised; though several boxes of ova which were kept packed in ice in England for 108 days under exactly similar conditions, produced a good percentage of fish. The Government of New Zealand intend to repeat the experiment this year, when Glasgow will be the port of despatch.

ON July 1 severe thunderstorms were felt in several parts of southern France, principally in and around Montpellier, which seems to have been a centre of electric manifestations. But the harm done was principally owing to the hailstones, which have been numerous and of considerable size, many of them reaching the bulk of a marble. Many crops were damaged, and even in some instances completely destroyed. These hail clouds travelled at a rapid rate from the eastern Pyrenees, near the Rhone, in a north-eastern direction for more than a hundred miles with a breadth of not more than eight or nine miles. A map will be published in the *Atlas Météorologique* of France, which was founded by M. Leverrier in 1864, and was published in 1864-68. The volume for 1869 will be issued shortly, and will contain the most notable facts for 1870-71. The publication, which has been stopped since M. Leverrier left the Observatory, will be resumed yearly henceforth, the Versailles National Assembly having granted the necessary funds. It has been remarked already by M. Charles Martin and the two Becquerels that hailstorms are always connected with thunderstorms, and follow mostly a strongly zigzag line, almost always recurring in a number of chosen spots, for which they seem to feel an irresistible attraction. Woods are very seldom touched by them, a fact which has induced MM. Becquerel to advise farmers to grow trees in order to be protected against hailstones. M. Arago encouraged some years ago a scheme for erecting captive balloons with an iron rod, connected with the earth by an iron chain, in order to provoke electrical discharges and suppress the cause of hail-production. The proposal seems to be rather daring, but the above statements render it desirable that it should at least be tried. Aiming at certain spots in preference to others, the efficiency of protection is sure to be easily tried. M. Colladon, a Genevan physicist, has published many experiments on the fall of lightning on trees. He supposes that poplars are really very attractive, and that they may effectually render the same service as true lightning conductors, if plates of iron are connected with the trunk and earth. These suggestions are very likely to be tried on a grand scale.

ICEBERGS seem to be unusually plentiful this season; a despatch from New York states that several ships have encountered them in uncommonly large numbers and of very unusual size.

MESSRS. TRÜBNER & Co. have in the press "Tea, Coffee, and Cocoa," a practical treatise on the examination of tea, coffee, and cocoa, by Mr. J. A. Wanklyn, M.R.C.S.

ANOTHER supplement, No. 37, to Petermann's *Mittheilungen* has just been issued, containing a long account of Carl Mauch's travels in the interior of South Africa in the years 1865-72. The accompanying map illustrates a journey made by Mauch in 1871-72, from Simbabye in 20° 10′ S., and 31° 40′ E. in a north and east direction, to Senna on the Zambesi, in 17° 20′ S., 35° 8′ E.

IF anyone wants to see how lamentable is the absence of practical work in the examination system of the University of London, let him get "Questions in Chemistry and Natural Philosophy given at the Matriculation Examination of the University of London from the year 1864 to June 1873, classified according to the syllabus of subjects," by C. J. Woodward, B.Sc. (Simpkin, Marshall, & Co.) We say nothing against the book itself, which is a creditable compilation of its kind, but the system capable of giving birth to such a text-book must be an unmitigated encouragement to "Cram."

A TELEGRAM dated Singapore, July 2, states that H.M.S. *Basilisk* had arrived there, having successfully completed a survey of the previously unknown north-eastern shores of New Guinea. Capt. Moresby reports that the existence of a new and shorter route between Australia and China is an established fact.

THE additions to the Zoological Society's Gardens during the past week include a Branded Ichneumon (*Herpestes fasciatus*) from West Africa, presented by Lady Sheffield; a Rose-ringed Parrakeet (*Palæornis docilis*) from the Zambesi River, presented by Mrs. Loveday; a Chimpanzee (*Troglodytes niger*) from West Africa; a Spectacled Bear (*Ursus ornatus*) from the Upper Amazon; an Eyra Cat (*Felis eyra*)) from South America; a Nisnas Monkey (*Cercopithecus nisnas*), an Eleonora Falcon (*Falco eleonoræ*) deposited; two Pumas (*Felis concolor*), and nine Rosy-billed Ducks (*Metopiana peposaca*) born in the gardens.

SCIENTIFIC SERIALS

THE *Journal of the Chemical Society* for June contains the following papers communicated to the Society:—On the cobalt bromides and iodides, by Walter Noel Hartley. The bromide is prepared by allowing metallic cobalt to stand in a dish with bromine and water for a week or so, when a purple solution is obtained which becomes blue after dilution and filtration. When evaporated over sulphuric acid, purple-red prismatic crystals separate, having the formula $CoBr_2 . 6H_2O$. When heated to 100° the salt loses 4 molecules of water. The iodide obtained in the same manner forms a mass of highly deliquescent green crystals. Heated to 100° in the air a basic salt is produced; on adding water and filtering a red oxyiodide is obtained, having possibly the formula Co_2I_3O. The green crystals have the formula $CoI_2 . 2H_2O$; an iodide, $CoI_2 . 6H_2O$, of a dusky red colour also exists, and likewise the anhydrous salt CoI_2, which is described as a black amorphous substance.—Note on the solubility of plumbic chloride in glycerin, by Charles H. Piesse. The author has made quantitative determinations of the amount of $PbCl_2$ dissolved by pure glycerin and by mixtures of glycerin and water. The mean of two experiments gives 1·995 as the amount of $PbCl_2$ dissolved by 100 parts of glycerin. The solubility is not perceptibly increased by the temperature. Experiments were also made with mixtures containing respectively 50, 75, and 87·5 per cent. of water, and the amount of $PbCl_2$ dissolved agrees very closely in each case with the number obtained by adding the amount of the salt dissolved in the water to the amount dissolved by the glycerin, the solubility in water being taken at 0·733 per cent.—On the products of the decomposition of castor oil. No. 2. The distillation of sodium ricinoleate, by E. Neison. The author's experiments confirm the statements of Bouis, that the sodium salt named yields methyl-hexyl ketone on destructive distillation. The results obtained by Städeler, who got by this reaction only heptylic aldehyde, are explained by a difference in the nature of the soap used.—Note on a reaction of gallic acid, by Henry R. Procter. When a solution of potassic or sodic arsenate is added to one containing gallic acid and the mixture exposed to the air, oxygen is absorbed, and an intense green colour produced. Dilute acids change the colour to purplish red—strong H_2SO_4

and HNO_3, and boiling HCl change it to a pale yellow. The colour is also destroyed by reducing agents.—On ozone as a concomitant of the oxidation of the essential oils. Part I. by Charles T. Kingzett. The author first determined the amount of oxygen absorbed by ether, oil of turpentine, and various essential oils. Various reactions of the so-called ozonised oil of turpentine have been studied. The oxidised substance resembles both ozone and hydrogen peroxide in certain properties, but its aqueous solution retains its properties after long-continued boiling. The substance is destroyed also by MnO_2 and by heating with $ZnCl_2$. The author concludes from his experiment that the supposed ozone is an oxidised compound of the turpentine oil, $C_{10}H_{16}O.H_2O$.—It is much to be regretted that the Society still finds it necessary to advertise on the wrapper of the present number (as also of the last) a list of books missing from the library.

American Journal of Science and Arts, June.—The first article is by W. Hilyard, Univ. of Michigan, On some points in Mallet's theory of vulcanicity. He gives a *résumé* of the state of the question. Among other points considered Mr. Hilyard says :—"While Mr. Mallet's theory accounts satisfactorily for earthquake phenomena and volcanic activity as manifested since the cessation of fissure eruption ; and also for the gradual or sudden depression of both large and small areas, even subsequent to that time ; it makes no provision for their elevation, and therefore leaves unexplained the numerous oscillations of level of which we find the record down to our own time. In assuming the movements as taking place exclusively within the solid shell, he (unnecessarily, it seems to me) leaves a point open to objection." . . . "At the first blush the 'squeezing out of sub-mountain liquid matter' assumed by Leconte as the consequence of the folding and fissuring of strata by tangential thrust, appears natural enough. Yet it seems hardly possible that the same force which makes and elevates mountain-folds (being the result of interior shrinkage) should at the same time serve to compress the interior liquid, unless either such folding occurs beneath the general level of the liquid ; or the latter is locally confined ; or the movement is so brusque or cataclysmal that viscosity would prevent the lateral or downward escape of the liquid rock." While the assumption of locally limited fire seas, as proposed by Dana, would remove the difficulty, calculation shows the required size of the seas to be such that they would approach to nearly a general undercrust fluidity.—In the second article Mr. L. Lesquereux replies to Dr. Newberry's objections to the Colorado Lower lignite formation being referred to the period of the Lower Eocene. He shows that many of the species it contains are common to Alum Bay and Mount Bolca, and he objects to Heer's statement that the floras of these two localities have "a distinctly tropical and Indo-Australian character." The next article is a continuation of Mr. C. H. Hitchcock's paper On the Helderberg rocks of New Hampshire. The beds in question border on the line of the Ammonoosuc River in three areas, the Littleton, North Lisbon, and Lyman. Of the fossils Mr. Billings says : "I do not consider the fossils sufficient to decide the age of the rock very closely, but only that it is Upper Silurian or Lower Devonian.' The communication, which occupies twenty pages, is illustrated with map and sections.—A description of a new fossil resin, by O. Loew, named by him Wheelerite. Its formula is C_5H_6O, and it melts at 154° C.—The next article is a completion of Mr. W. M. Fontaine's paper On the great conglomerate on New River, West Virginia. This series, while in some features resembling the lower coal rocks, is distinguished by an almost entire absence of shales. The study of it has led to the consideration, "Does not the successive formation of coal on an extended scale along the south-west border of the Appalachian coal-field, commencing in the Devonian period, point to the existence at this time of a continental mass nearer than the azoic of Canada?"—On a felspar from Bamle in Norway, by G. W. Hawes.—Notes on some fossils in Illinois State Geological Reports, vol. v., by F. B. Meek.—Chemical composition of the wood of Acrogens, by C. W. Hawes. The analyses show that the wood of Acrogens does not differ in ultimate composition from forest trees.—Under the head "Scientific Intelligence," there is a note that a skeleton of a whale (*Beluga vermontana*) has been found at a depth of 12 ft. 6 in. in clay of the Champlain period, at Jacquet River, Dalhousie, New Brunswick.—The flora of the Dakota group of the Cretaceous is, according to Mr. Lesquereux, remarkable for the absence of any European species of the same age.

THE *Geographical Magazine*, July.—This number opens with an interesting sketch of the history of Indian Marine Surveys.—Col. H. Yule, C.B., contributes an abstract from the *Bulletin* of the St. Petersburg Geographical Society of Mr. F. Paderin's account of his visit to the site of Karakaroum in 1873, which is illustrated by a sketch-map.—Another paper by Col. Yule contains some valuable information concerning the wonderfully accurate *Atlas Sinensis* (1655) of the Jesuit Martin Martini.—A number of valuable notes on the Kashgar Mission are given in the form of letters from Lieut.-Col. Gordon and Capt. Biddulph.—Baron von Richthofen sheds considerable light on the question of land communication between Asia and Europe. No one is entitled to speak with more authority than this great explorer of China, and he distinctly states that "the trade-route from Si-ngan-fu, past Hami, to Kuldja, is the best natural line for a railway from China to Europe." He is confident of the practicability of the undertaking.

THE *Journal of Botany*, May, June, July.—The number for May commences with a short sketch of the life of a little-known botanist, William Sherard, a contemporary of Ray, who died in 1728, and bequeathed his library and herbarium to the University of Oxford, together with an endowment of 3,000*l.*, for the Professor of Botany.—Mr. F. A. Lees has a useful paper On the flora of the Yorkshire coal-field.—Prof. Thiselton Dyer appends some remarks to a translation of M. Vesque's paper On new species of Dipterocarpus, from the *Comptes Rendus*, some of M. Vesque's names having a claim of priority over those published by Prof. Dyer in the preceding number of the *Journal*, while others appear identical with previously described species, and to have been published on insufficient grounds.—In the number for June the papers are mostly of a character to interest species-botanists only.—Mr. J. G. Baker describes some new species of Dracæna from Tropical Africa.—The same remark may be applied to the number for July, with the exception of an account of the Botanical Congress at Florence, continued from the preceding number, and reprints of the Official Reports of the Keeper of the Botanical Department of the British Museum, and the Curator of the Herbarium and Library at Kew for 1873.—One or more plates in every number now add to the permanent value of this admirably conducted magazine.

IN the *Scottish Naturalist* for July, we find papers on Scotch zoology, phytology, and geology. We would call special attention to one by Mr. G. Sim, On the food and use of our rapacious birds, an eloquent appeal for the protection of our "Raptores," which are now becoming scarcer every year. From an examination of the stomachs of 305 birds which have passed through his hands during the last ten years, eagles, buzzards, ospreys, falcons, merlins, kestrels, sparrow-hawks, owls, &c., the author has come to the conclusion that the injury done by these birds to the farmer and game-preserver is very small compared to the benefit, by far the most abundant articles of their food being mice, shrews, and various insects. Even when hawks do kill game, he maintains that it is the weakly and sickly birds that fall victims.—Mr. F. Smith concludes his paper On the geology of the Earn Valley, and Dr. Buchanan White and Dr. Sharp give further instalments of the Lepidoptera and Coleoptera of Scotland.

THE *Transactions of the Linnean Society* has now entered on its thirtieth volume. The first part, just published, contains Mr. J. Scott's paper On the tree-ferns of British Sikkim, illustrated with eighteen plates ; a paper On some recent forms of *Lagenæ* from deep-sea soundings in the Java seas, by F. W. O. Rymer Jones, with one plate ; an enumeration of the Orchids collected by the Rev. E. C. Parish near Moulmein, by Prof. H. G. Reichenbach, f., with six plates ; and a most elaborate and laborious monograph of the habits, structure, and relations of the three-banded armadillo, *Tolypeutes conurus*, by Dr. James Murie, with seven plates.

Memorie della Societa degli Spectroscopisti Italiani, May.—Secchi and Tacchini contribute a table showing the solar prominences for November and December 1872, in which there is a marked aggregation of prominences on either side of the solar equator and a total absence at the poles.—There is also a coloured plate of some prominences and faculæ, by Gautier.—Schiaparelli gives an account of Capt. Tupman's observations on shooting stars, accompanied by a table showing the length of the trajectory in degrees and duration of numbers of meteorites.—Lorenzoni gives a discussion of the results of the researches at the Vienna University on the orbits of meteorites, with a table showing the elements of sixteen meteor streams.—Prof. Bredichin gives his solar observations for last autumn, together with a discussion on the formation of prominences.—Tacchini gives his observations on solar spots for May 1874.

Astronomische Nachrichten, No. 1,997.—This number contains an account of the observations of the minor planet Virginia since its discovery in 1857, and the following elements are calculated :—

1874, June 19, Berlin.

$$\begin{array}{rcrrr} & & {}^{\circ} & {}' & {}'' \\ M & = & 322 & 19 & 49{\cdot}80 \\ \pi & = & 10 & 0 & 42{\cdot}76 \\ \Omega & = & 173 & 27 & 39{\cdot}0 \\ i & = & 2 & 47 & 53{\cdot}5 \\ \phi & = & 16 & 37 & 4{\cdot}3 \\ \mu & = & \multicolumn{3}{l}{822''{\cdot}710835} \\ \text{Log.}\, a & = & \multicolumn{3}{l}{0{\cdot}4231729} \end{array}$$

An ephemeris is also added for the opposition this summer.—Doberck contributes new elements for Comet I., 1824, deduced from Rümker and Sir J. Brisbane's observations.—Some observations of position of Henry's Comet, 1873, are given by J. J. Plummer.—No. 1,998 contains a paper on the photographic processes applicable to the transit of Venus.—C. S. Sellack contributes a paper on the direct photography of the solar protuberance.—A communication on the elements of the orbit of Alceste is made by A. Hall, corrected by observations made at Washington.—M. Flammarion gives the following periods of double stars :—

	Years.	Apparent semi-axis major.	Perihelion passage.
		″	°
ξ Ursa Majoris . .	60·60	2·45	1873·40 at 358
ζ Horculis	34·57	1·19	1864·35 at 298
η Corona Bos . . .	40·17	0·865	1853·95 at 287
γ Virginis	175·	3·385	1836·45 at 320

No. 1,999. — This number contains an ephemeris of the five inner satellites of Saturn from June 1 to Oct. 28, by A. Marth, and a discussion of the various theories of comets, by W. Zenker.—In No. 2,000 is an account of some spectroscopic observations on certain variable and other stars, by H. C. Vogel; the author gives the wave-lengths of the lines in some cases.—G. Strasser gives a number of observations on comets (Winnecke and Coggia), together with the list of comparison stars.—C. H. F. Peters contributes observations on some of the planetoids, and A. Krüger gives some position observations of Coggia's comet.

Justus Liebig's Annalen der Chemie und Pharmacie, Band 172, Heft 1. This number contains the following papers :—A condensation product of glyoxal, by Hugo Schiff. Glyoxal is dissolved in five or six volumes of strong acetic acid and a stream of hydrochloric acid gas passed through the solution for about fifteen minutes. The solution on standing deposits a white substance, which was found to possess the composition $C_{12}H_{14}O_{13} = 6C_2H_2O_2 + H_2O$, and which the author proposes to name *hexaglyoxal hydrate*. Treated with acetic anhydride, one atom of hydrogen is replaced by acetyl, giving the compound $C_{12}H_{13}(C_2H_3O)O_{13}$; similarly with benzoyl chloride the compound $C_{12}H_{13}(C_7H_5O)O_{13}$ is produced. The author concludes from these reactions that the substance contains *one* semi-molecule of hydroxyl.—Improved air-bath for heating sealed tubes, by J. Habermann.—On the oxidation products of amylum and paramylum with bromine, water, and oxide of silver, by the same. Amylum yields dextronic or glucosic acid $C_6H_{12}O_7$, and paramylum the same. The calcium, barium, and cadmium salts of the acids were examined.—On the sodium contained in the ashes of plants, by G. Bunge. The author is of opinion that the result obtained by Peligot, who found that the ash of beans was free from sodium, is due to some error in the method of determination employed. An examination of the analytical method employed by Peligot has been undertaken, the results of the analysis of the ash of cows' milk being given as an example. This examination leads the author to the conclusion that by determining the alkalies merely in the aqueous extract of the ash, not only is a low value obtained, but the ratio between the two bases is a false one. Details of the method of analysis adopted are next given, and its application to the ash of beans, clover, meadow grass, apples, and strawberries. The author remarks that by his analyses Peligot's conclusions are not refuted, but at the same time they cannot be considered as established on the grounds of the analyses made by that chemist.—On oxysulphobenzide and a new derivative of this substance, by Dr. J. Annaheim. The following substances are described in this paper :—Oxysulphobenzide, $\left(\left.\begin{matrix} C_6H_4HO \\ C_6H_4HO \end{matrix}\right\} SO_2 \right)$; Phenoltrisulphonic acid, $\underset{(SO_3H)_2}{\overset{HO}{C_6H_2}}SO_3H$; Tetrachloroxysulphobenzide, $\left.\begin{matrix} C_6H_2Cl_2OH \\ C_6H_2Cl_2OH \end{matrix}\right\} SO_2$, and the corresponding bromine and iodine compounds ; methyloxysulphobenzide, $\left.\begin{matrix} C_6H_4OCH_3 \\ C_6H_4OCH_3 \end{matrix}\right\} SO_2$; the dinitromethyl compound, $\left.\begin{matrix} C_6H_3NO_2OCH_3 \\ C_6H_3NO_3OCH_3 \end{matrix}\right\} SO_2$; the diamido compound, $\left.\begin{matrix} C_6H_3NH_2OCH_3 \\ C_6H_3NH_2OCH_3 \end{matrix}\right\} SO_2$; the ethyl compound, $\left.\begin{matrix} C_6H_4OC_2H_5 \\ C_6H_4OC_2H_5 \end{matrix}\right\} SO_2$ the corresponding amyl compound, and their nitro-, amido-, and brominated substitution derivatives.—The concluding paper is by Otto Hecht and Julius Strauss : On normal hexylene and some of its derivatives. The authors have examined the dibromide $C_6H_{12}Br_2$, and the monobromide, $C_6H_{11}Br$.—A plate illustrating Habermann's paper On an improved air-bath accompanies the present part.

SOCIETIES AND ACADEMIES

LONDON

Anthropological Institute, July 1.—Special meeting at the East London Museum, Bethnal Green.—Prof. Busk, F.R.S., president, in the chair.—Col. Lane Fox read a paper on the principles of classification adopted in the arrangement of his anthropological collection exhibited in the East London Museum. The paper contained three divisions, viz. Psychological, Ethnological, and Prehistoric. The author's object had been, during the twenty years he had been occupied in forming the collection, to select the specimens not so much for their rarity or beauty as for their utility in illustrating the succession of ideas by which the minds of men in a primitive condition of culture had progressed from the simple to the complex. Contrary to the usual system of arrangement, which was geographical, and was to be found in most ethnographical museums, the author's primary arrangement had been guided by form, *i.e.* spears, bows, clubs, &c. had been placed by themselves in distinct classes ; and within each class there were sub-classes for special localities, and in each of the sub-classes the specimens were arranged according to their affinities. It was shown how far the arts of existing savages might be employed to illustrate the relics of primeval men. In studying the evidence of progress, the phenomena that might be observed were (1) a continuous succession of ideas ; (2) the complexity of the ideas in an increasing ratio to the time ; (3) the tendency to automatic action upon any given set of ideas in proportion to the length of time during which the ancestors of the individual have exercised their minds in those particular ideas. After a lengthened elaboration of those psychological considerations Col. Fox pointed out that the forms of implements used by savage races, instead of affording evidence of their having been derived from higher and more complex forms, showed evidence of derivation from natural forms, such as might have been employed by man before he had learned the art of modifying them to his own use ; and that the persistency of the forms is in proportion to the low state of culture. That conclusion was illustrated by reference to the Australian and other savage peoples. The third and concluding part of the paper was devoted to the correlation of modern implements in use among existing savages with those of Prehistoric times.—The reading of the paper was followed by an explanation of the collection, which was arranged with a view to illustrate the principle of sequence contended for by the author.

PHILADELPHIA, U.S.

Academy of Natural Sciences, Dec. 23.—Dr. Ruschenberger, president, in the chair.—Prof. Cope made some remarks on fishes from the coal measures at Linton, Ohio. He stated that Prof. Newberry, Director of the Geological Survey of Ohio, had sent to him numerous specimens of fishes and batrachians for determination and description. Among these he had discovered batrachians which were labelled and had been described as fishes (*Pygopterus scutellatus* Newb.), and fishes (*Conchiopsis* and *Peplorhina* Cope) some of which were labelled "Amphibian or Reptilian." Having determined the latter to be fishes and described them, he called attention to a note of Prof. Newberry on the latter, in which he states (1)